



Appendix I-E

Human Health Risk

This appendix provides the details of the input and output of the screening assessment of risk to human health, whereas Section 5.2 presents the methodology and key results of the assessment. Much of the information in this appendix is provided on diskette. Several of the files on diskette are very large. To make them available, they have been compressed with the commercial compression routine PKZIP (PKWARE 1992). “Exe” as the extension of the file name indicates those files that have been compressed and that can decompress themselves. When these files are decompressed, they will automatically reestablish the computer code and necessary input files. The files provided, if all decompressed, will require a total of over 140 megabytes of hard disk storage. The reader is cautioned to have ample disk storage available.

To decompress an “exe” file, the following needs to be done:

- ◆ Create a directory on your hard drive and copy the “exe” files into it from the diskette.
- ◆ To decompress the files:
 - In DOS, while in the directory you created, type the “exe” file name and hit “enter.”
 - In Microsoft Windows File Manager, double click on each “exe” file and it will decompress. To view the decompressed file names in File Manager, click on REFRESH under WINDOW.
 - In Microsoft Windows 95, click on START, then RUN, then BROWSE; indicate directory you have created; double click on each “exe” file to decompress it.
- ◆ To view the individual files, open the files in any text processing software or spreadsheet.

This appendix provides information on the following:

- ◆ computer code and parameters of calculations
- ◆ results of the calculations
- ◆ computer code for the statistical analysis of downstream/upstream comparisons and the results
- ◆ scenario additivity
- ◆ sample calculation of human risk



Computer Code and Parameters of Calculations

A computer code, HUMAN, was used to implement the equations of Section 5.2.1. The HUMAN code was developed under quality assurance controls. Documentation of the code requirements, development specifications, development testing, and a user's manual are available in project records. A compressed copy of the HUMAN code in compiled FORTRAN is included on diskette with this report. The compression routine PKZIP2 (PKWare 1992) was used to make self-extracting files. Upon execution, these compressed files uncompress into the full suite of original ASCII or FORTRAN files.

For input, the HUMAN code used the media files described in Section 3.0. Compressed copies of the deterministic media files are included on the diskette as well. These files are directly related to the media files described in Section 3.0 and Appendix I-B. The files were converted to a format readable by the HUMAN code. In addition, all of the deterministic and stochastic input files for the scenarios are provided in compressed form. The stochastic media files are too large to put on diskette even when compressed. They may be obtained on request. For the computer code and parameters of calculations, the diskette contains the following information:

<u>Filename:</u>	<u>File description</u>
humancod.exe	Compressed, self-extracting, executable HUMAN code
hh_dt_ex.exe	Compressed, self-extracting, deterministic, external measurements media file used by HUMAN
hh_dt_ss.exe	Compressed, self-extracting, deterministic, environmental media concentrations file used by HUMAN
det_key.exe	Eleven compressed, self-extracting, scenario input files for the HUMAN code for the deterministic calculations
sto_key.exe	Eleven compressed, self-extracting, scenario input files for the HUMAN code for the stochastic calculations

Results of the Calculations

All numerical results of the calculations described in Section 5.2 are provided in this appendix and included on a diskette provided with the report. Section 5.2.3.2 (Figures 5.5 and 5.6) provided human health risk for the Ranger Scenarios and the Native American Subsistence Resident Scenario. Human health risk estimated for the other scenarios at each location is shown in Figures E.1-E.9. Each scenario has three graphics: one depicting the estimate of risk from carcinogenic chemicals, one depicting the hazard index estimated from toxic chemicals, and one depicting the estimate of risk from radionuclides. (Graphics are not provided for the Columbia River Island User Scenario because it was only evaluated at the point of highest cobalt-60 particle contamination, the island immediately downstream of the 100-D Area. Therefore, the risk results are not presented for the other segments.)

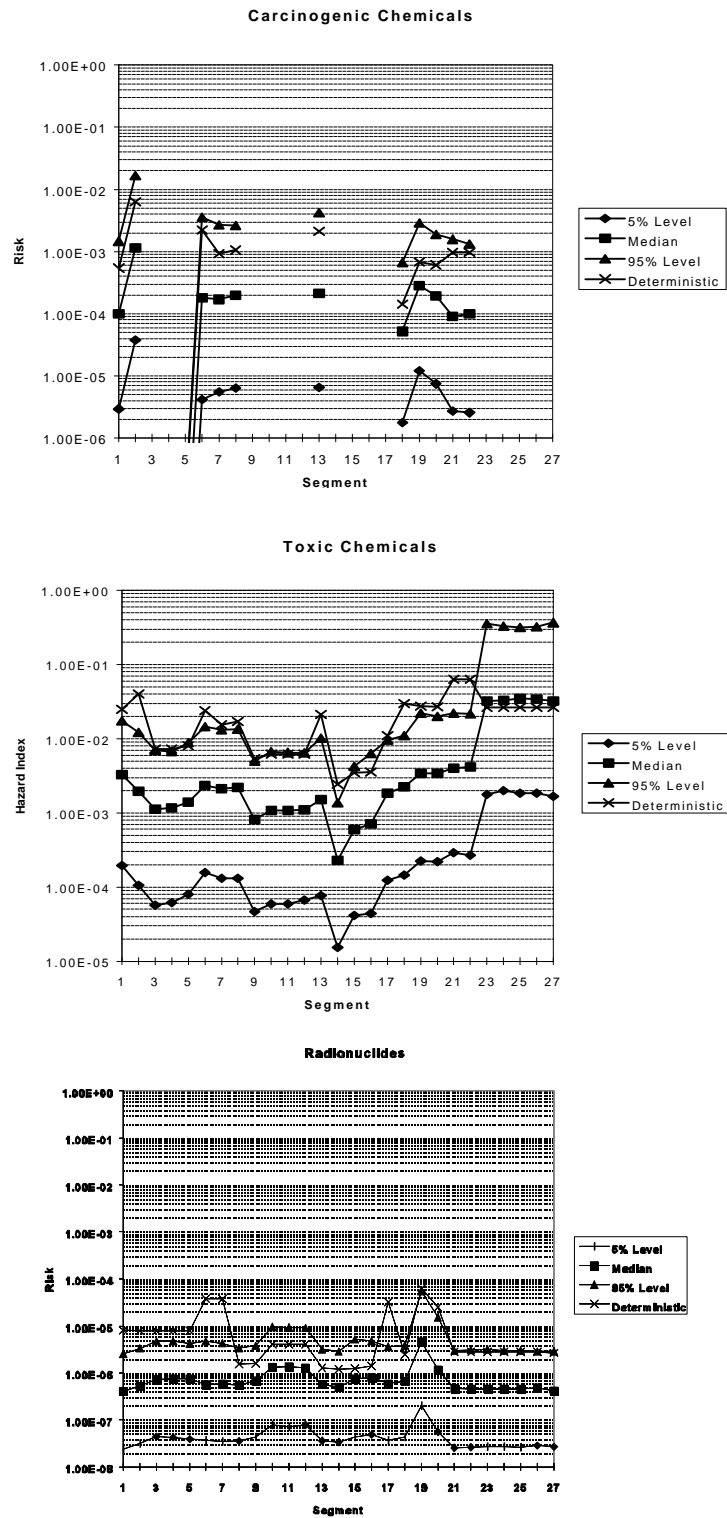


Figure E.1. Human Health Risk Estimate for the Industrial Worker Scenario

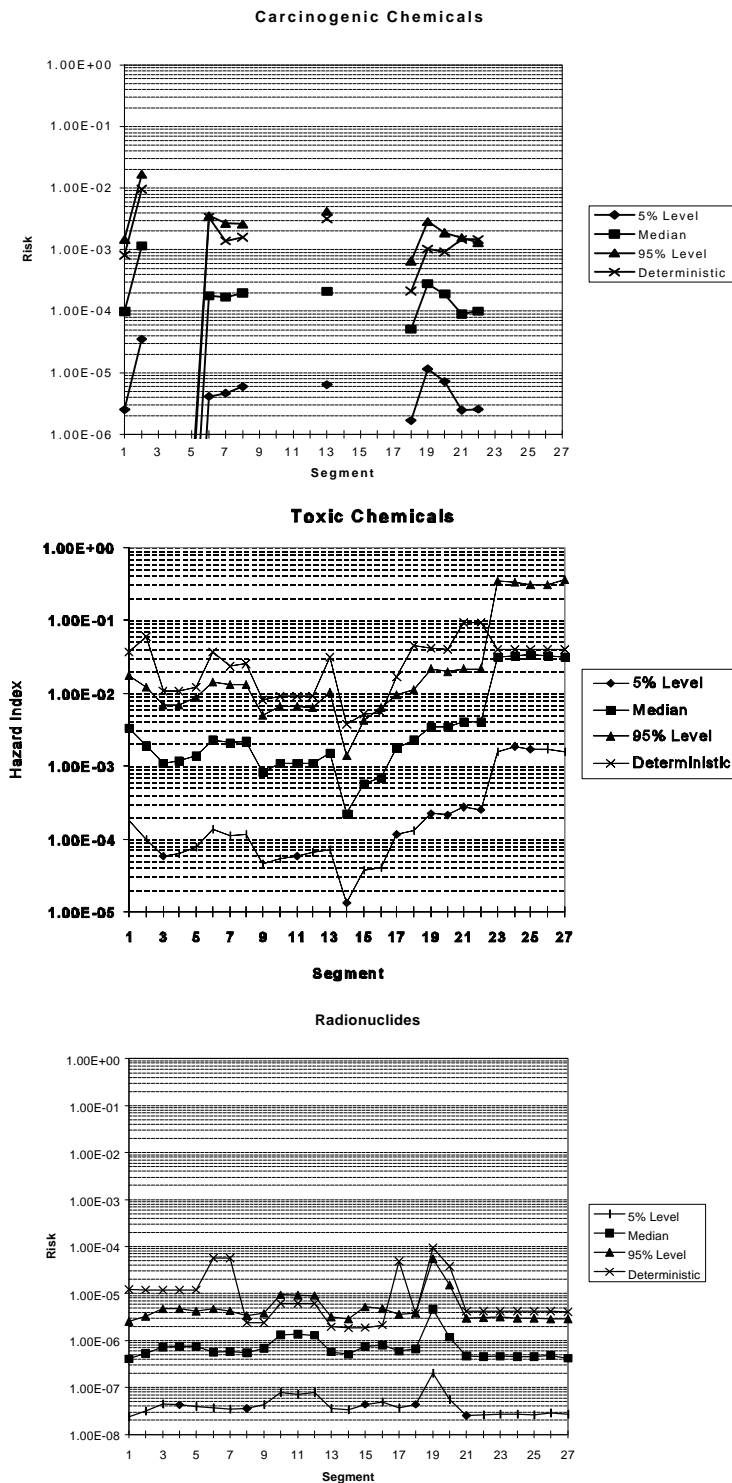


Figure E.2. Human Health Risk Estimate for the Fish Hatchery Worker Scenario

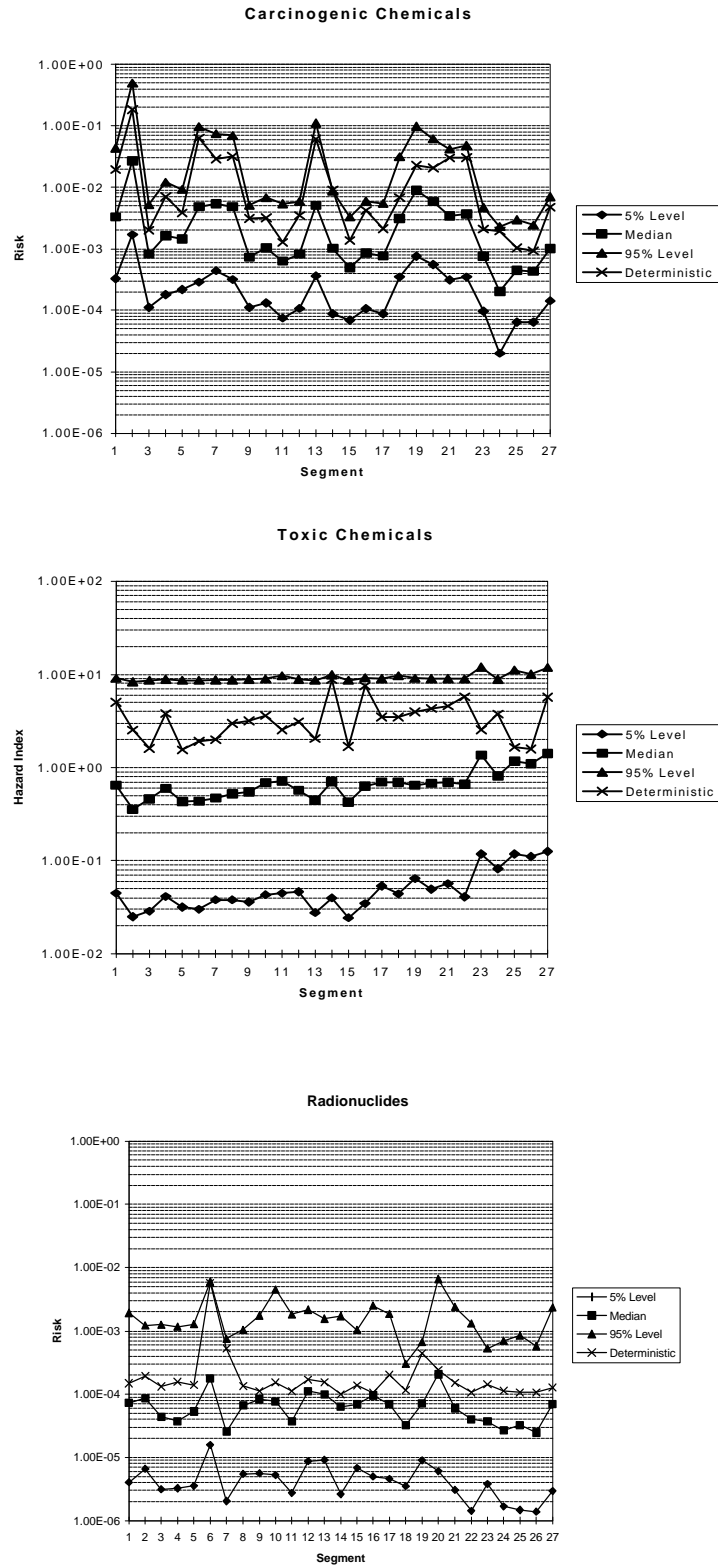


Figure E.3. Human Health Risk Estimate for the Avid Recreational Visitor Scenario

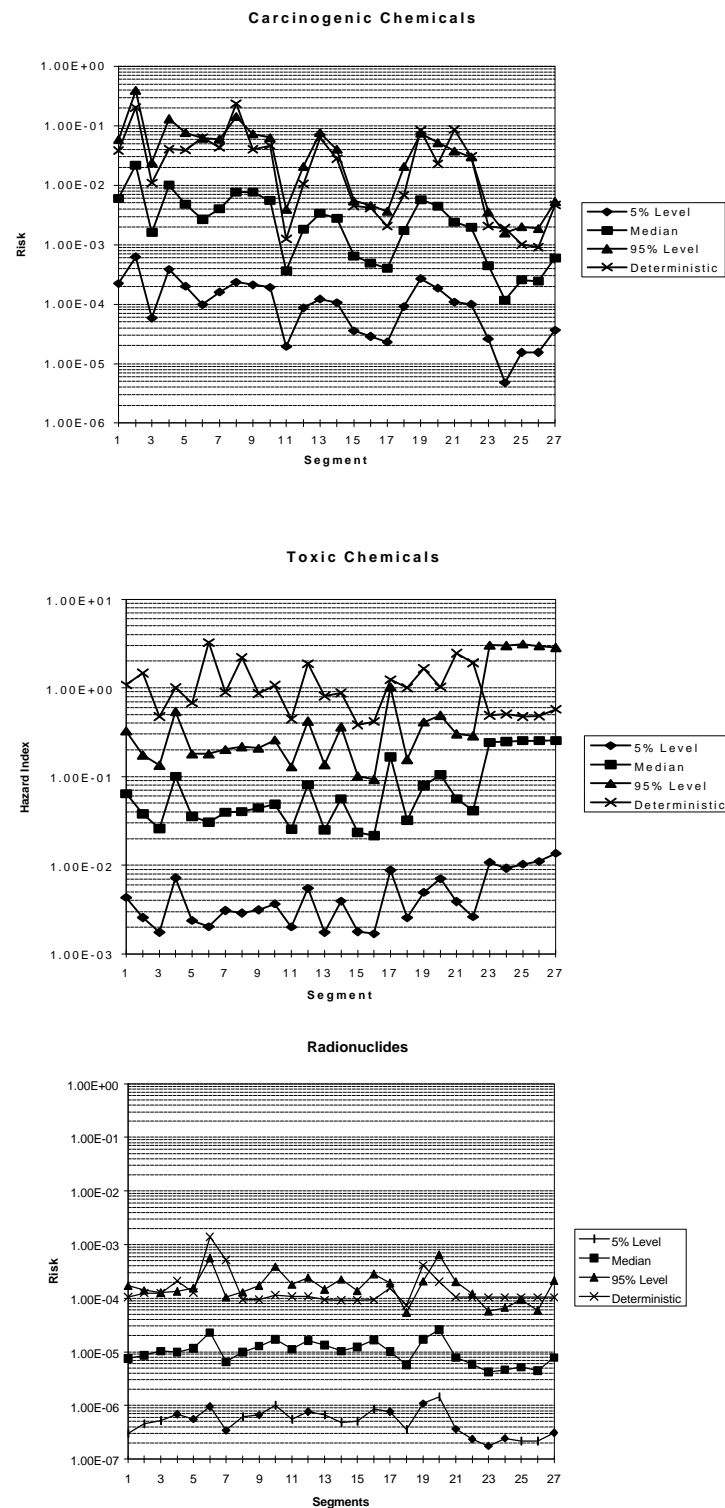


Figure E.4. Human Health Risk Estimate for the Casual Recreational Visitor Scenario

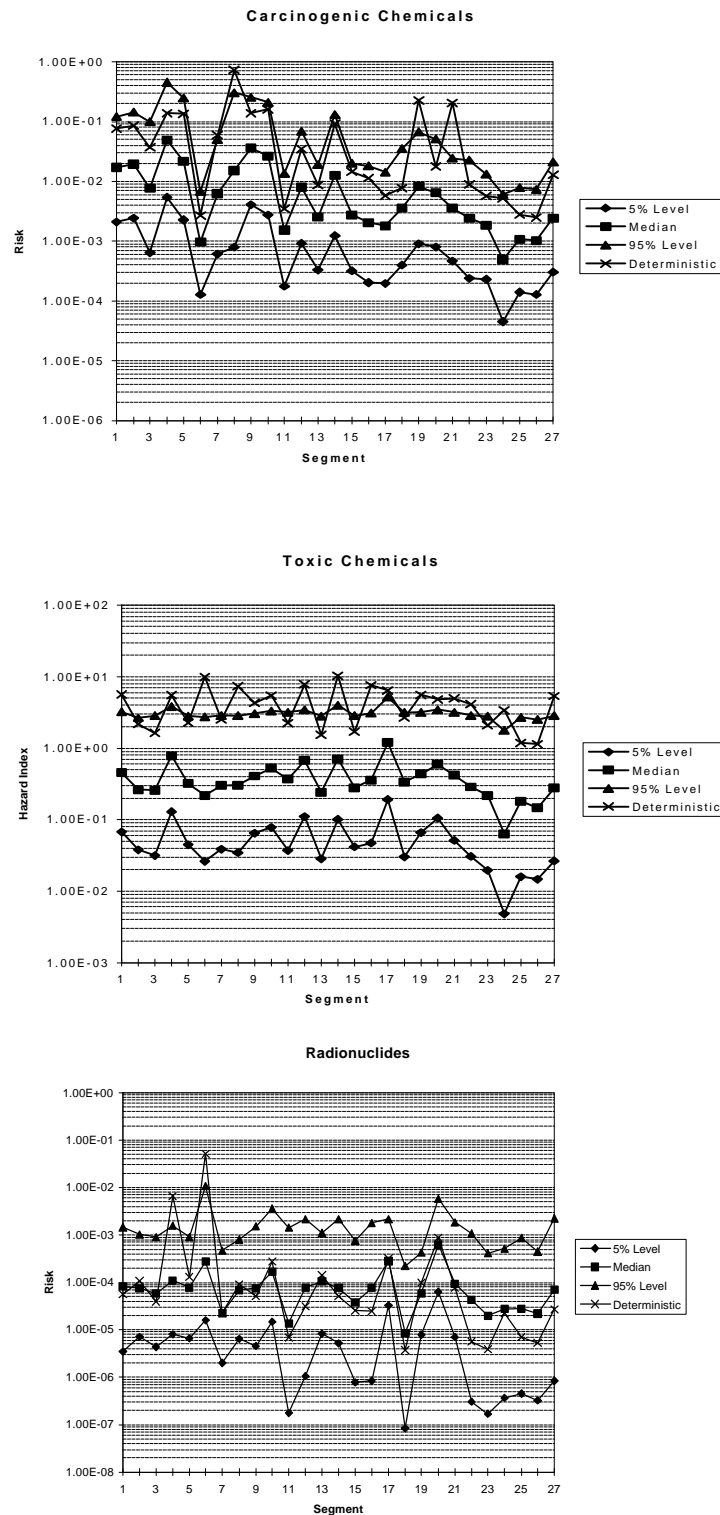


Figure E.5. Human Health Risk Estimate for the Native American Upland Hunter Scenario

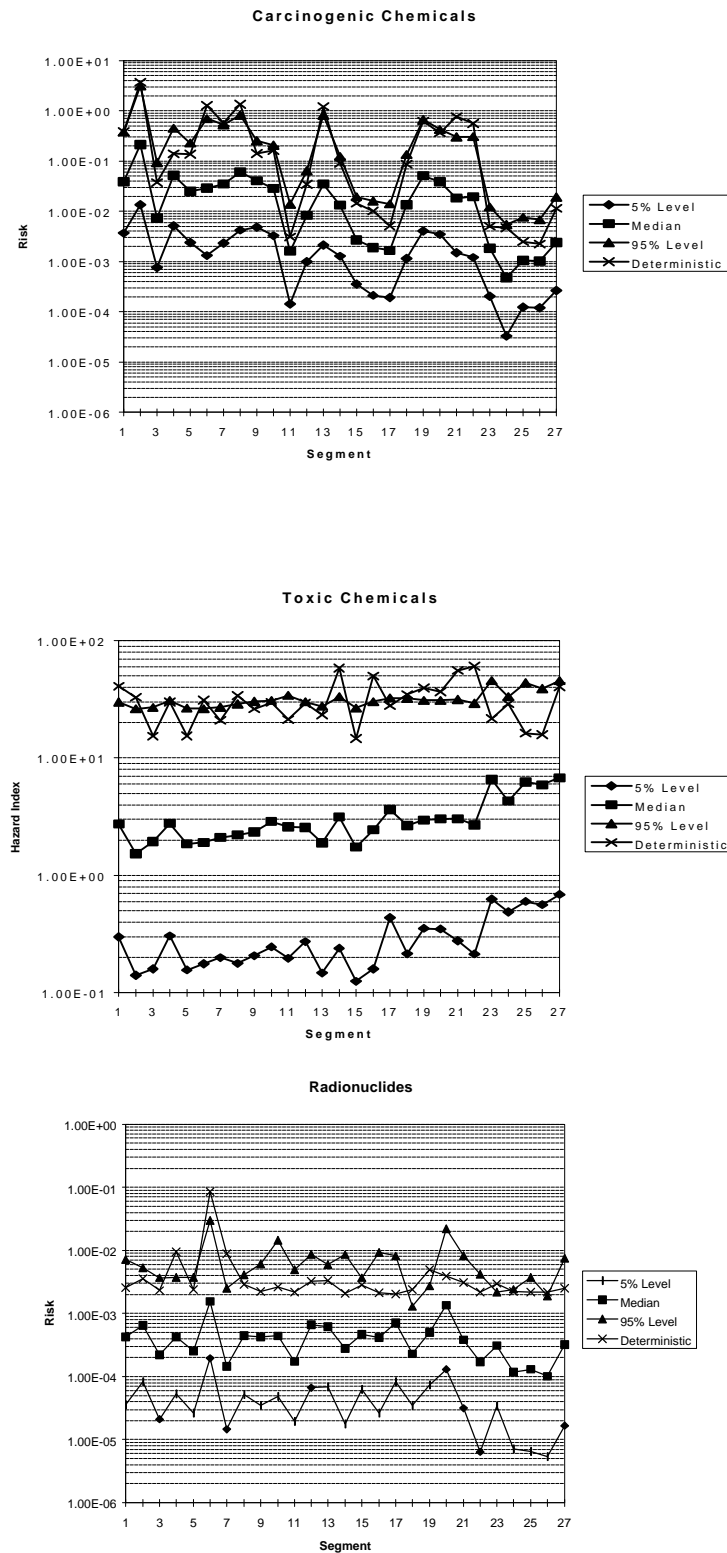


Figure E.6. Human Health Risk Estimate for the Native American River Focused Hunter and Fisher Scenario

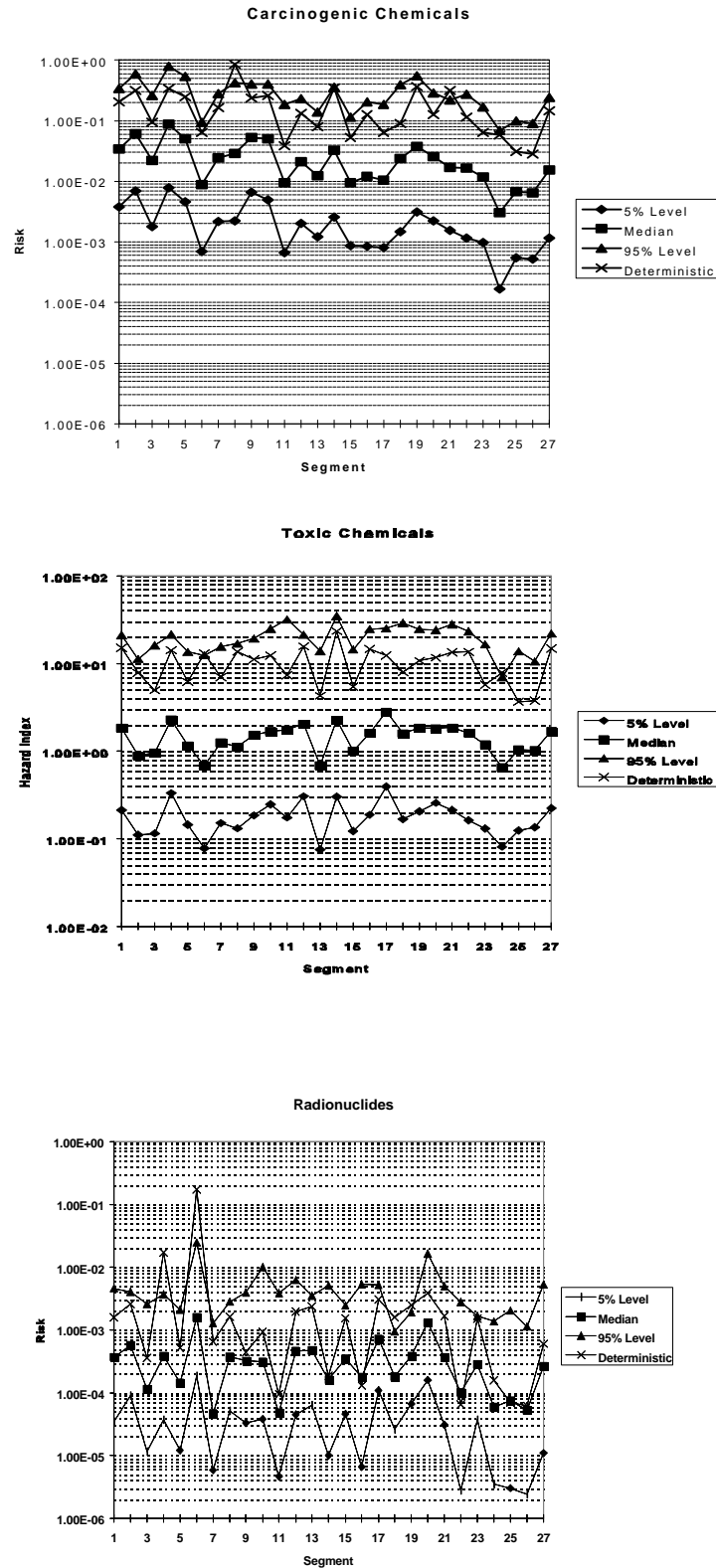


Figure E.7. Human Health Risk Estimate for the Native American Gatherer of Plant Materials Scenario

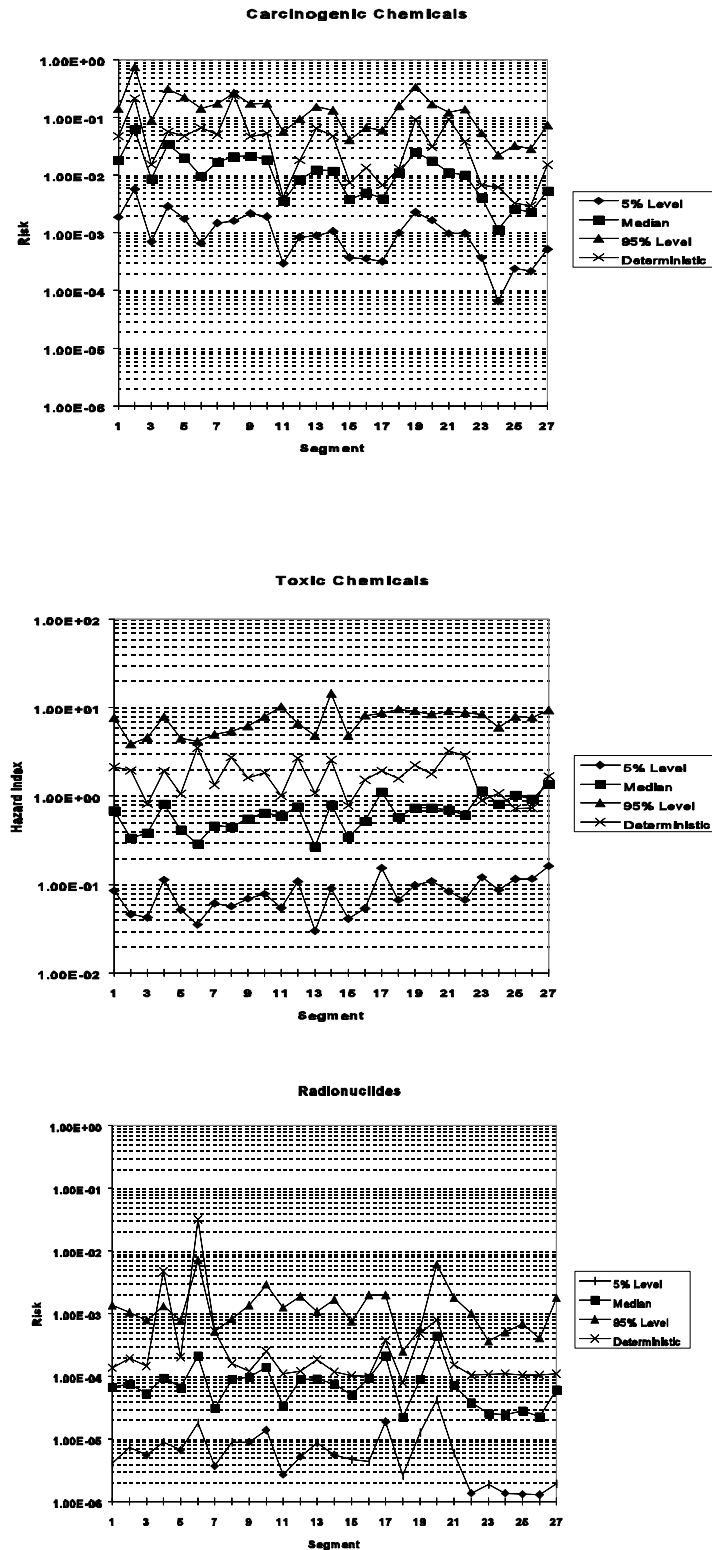


Figure E.8. Human Health Risk Estimate for the Resident Scenario